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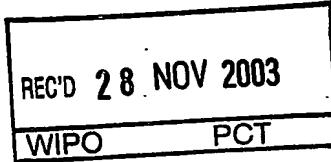
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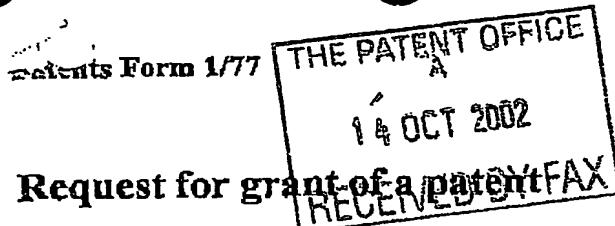
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14 OCT 02 E755281-1 D02906
P01/7700 0.00-0223707.1

1. Your reference	TBS/BAR/37402.GBA		
2. Patent application number	0223707.1		
3. Full name, address and postcode of the or of each applicant (<i>underline all surnames</i>)	<p>Anthony <u>B</u> PIKE 10 Auckland Close Upper Norwood London, SE19 2DN</p> <p>BRUCE SOP APL RAB</p>		
Patents ADP number	7110919001		
If the applicant is a corporate body, give the country/state of its incorporation			
4. Title of the invention	Mat		
5. Name of your agent (<i>if you have one</i>)	Raworth Moss & Cook		
"Address for service" in the United Kingdom to which all correspondence should be sent	36 Sydenham Road, Croydon, Surrey, CR0 2EF		
Patents ADP number	1362001		
6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or each of these earlier applications and (<i>if you know it</i>) the or each application number	Country	Priority application number	Date of filing
	GB	C13C459.1 CANCELLLED	26.12.2001
7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application		42 14/12/02	PR 14/12/02
8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (<i>Answer yes if:</i>)	No		
a) <i>any applicant named in part 3 is not an inventor, or</i>			
b) <i>there is an inventor who is not named as an applicant</i>			
c) <i>any named applicant is a corporate body</i>			

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document.

Continuation sheets of this form -

Description 5

Claim(s) 1

Abstract -

Drawing(s) 4

10. If you are also filing any of the following, state how many against each item.

Priority documents -

Translations of priority documents -

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*) -

Request for preliminary examination and search (*Patents Form 9/77*) 1

Request for substantive examination 1
(*Patents Form 10/77*)

Any other documents (*please specify*) -

11.

I/We request the grant of a patent on the basis of this application

Signature

Date

14 October, 2002

12. Name and daytime telephone number of person to contact in the United Kingdom

Raworth Moss & Cook (Mr T Bain Smith)
020 8688 8318

T85/8AR/37402.GBA
14 October 2002**DUPLICATE**

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MAT

The present invention relates to patient handling devices which include a stretcher and a mat for use on a bed.

5

Rescue stretchers are either rigid or flexible and are normally placed to one side of a patient who is then lifted or rolled (termed "logrolled") on to the stretcher. Both methods of placing the patient on the stretcher are 10 dangerous since spinal injuries can be aggravated by the action of lifting or rolling. In order to prevent further injury where spinal injury has already occurred, it is clearly necessary if possible to move the patient onto a stretcher without disturbing the patient, particularly 15 moving the patient's head relative to the rest of the patient's body.

A mat according to the present invention comprises a frame at least partly surrounding two matrices each of a plurality 20 of spheres, each matrix when flat having its spheres mounted for rotation in substantially a single plane, the plane of one matrix being parallel to that of the other matrix, the spheres of one matrix located so as to lie at least mostly against the spheres of the other matrix so that rotation of 25 spheres of one matrix results in counter rotation of spheres of the other matrix.

The juxtaposition of the spheres enables the mat to be pushed or pulled under a patient lying on the ground after 30 an accident with the lower surface of the lower matrix spheres acting on the ground and the upper surface of the upper matrix spheres acting on the patient. Rotation of the lower spheres in one direction causes the upper spheres to rotate in the opposite direction. The result is that little 35 or no movement is transmitted to the patient as the mat moves under the patient.

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5 In an alternative use for the mat, it can be slid under a patient on a bed and the patient lifted to change a sheet. Also the mat can be slid under a patient subject to bed sores and moved to and fro to massage the patient. This is particularly advantageous where the patient is unable to move his or her body.

10 The matrices should be arranged to hold the spheres of each matrix separate from each other but sufficiently close that the spheres of the lower matrix support the spheres of the upper matrix. The spheres are preferably arranged to be held in each matrix by means of a sheet of material having holes of a diameter smaller than that of the spheres so that each hole locates each sphere in the correct geometrical 15 position in the matrix. Preferably the perimeter of the pair of matrices is defined by a frame to which the material holding the spheres may be fixed. The frame may have loops or toggles so that the mat can be grasped or hooked onto for manoeuvring.

20

In one embodiment the mat of the invention has means for attachment to an inflatable secondary mat. The secondary mat may have detachable poles to enable it to be carried as a stretcher.

25

In a further embodiment the mat of the invention may itself have suitable means to enable it to be carried as a stretcher, straps being provided to hold the patient on the mat.

30

An embodiment of the invention will now be described with reference to the accompanying drawings, in which:-

35 Figure 1 is a perspective view of a part of a mat according to the present invention;

Figure 2 is a vertical cross section of the mat of

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Figure 1 taken at A-A.

Figure 3 is a plan view of part of the mat of Figure 1;

5 Figure 4 is a perspective view of the mat of Figure 1
attached to an inflatable stretcher.

10 Figure 5 is a plan view of a second embodiment where
spheres are threaded with an upper and lower matrix; and

Figure 6 is a plan view of the second embodiment
showing the spheres woven in the matrices.

15 The mat of Figure 1 is formed with a frame 2 made of a
flexible plastics material having a chamfered edge 4 and
supporting an upper perforated sheet 6 and a lower
perforated sheet 8. The upper perforated sheet locates a
plurality of spheres 10 and together they form a first
matrix 12. The lower perforated sheet 8 locates rows of
20 spheres 14 which form a second matrix 16. The upper rows of
spheres 10 of the first matrix seat on the lower spheres of
the second matrix in such a way that most of the upper
spheres each are supported on four lower spheres.

25 The upper spheres 10 located in perforations 18 of sheet 6
are such as to allow free rotation of spheres 10.
Similarly, perforations 20 in lower sheet 8 allow free
rotation of spheres 14. Since the upper spheres are seated
30 on the lower spheres, any rotation of the lower spheres will
cause counter rotation of the upper spheres. In this way,
any movement of mat 1 when placed on the ground will cause
the upper spheres to move in the opposite direction to the
mat.

35 The spheres 10 and 14 are preferably made of hard plastics
material about 20 mm in diameter and should be substantially
inflexible whilst the sheets 6 and 8 require to be

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sufficiently rigid to maintain the spheres in their correct location but at the same time to have a certain degree of flexibility to allow for the mat to move over an uneven surface.

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In Figure 4, the mat 1 is attached detachably to an inflatable platform 22 which is kept rigid only by inflation through nozzle 24 and by carrying handles 26 inserted in sleeves 28 on either side of the platform. The attachment 10 of mat 1 to platform 22 may be by any suitable means such as buttons or by hook and loop material like Velcro (Registered Trademark).

In order to move a patient from an accident site, the mat 1 15 is placed at the foot end of the patient with the chamfered slope 4 towards the patient. The rods 26 with hooks 30 at their ends are then hooked on to loops 32. The platform 22 is attached to the mat at an attachment 34 and the mat is then pulled by the rescuers under the patient in direction 20 Z. Because the upper spheres 10 on the mat rotate with ground movement in direction X, which is contrary to movement of mat Z, the patient is not moved relative to the ground in the horizontal direction although of course there will be slight lifting of the patient in the vertical 25 direction. The platform 22 is made of a suitably smooth material so that as the patient moves over the mat and beyond the mat, the patient will be gradually moved on to platform 22. Poles 26 are then inserted in sleeves 28; the mat is detached from the platform and the patient is then 30 stretchered away. The spheres when laid under the patient act to massage the patient who if able to move can be assisted in this movement by the mat. In an alternative use, the mat without platform 22 can be laid on to a bed, the mat being of such a size as to cover perhaps half or 35 quarter of a bed and either used to transfer a patient from a stretcher on to the bed or else pulled under the patient so that the patient can be lifted off the bed for changing

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sheets. For this purpose the spheres 50 (see Figures 5 and 6) are about 5 mm in diameter or less. The mat for this embodiment is formed by threading the spheres on sacrificial thread 52 and weaving the threaded spheres into a matrix, then dissolving the sacrificial thread to leave the spheres rotatably supported by the weave 54 of the woven matrix.

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14 October 2002CLAIMS

1. A mat comprising a frame at least partly surrounding two matrices each of a plurality of spheres, each matrix when flat having its spheres mounted for rotation in substantially a single plane, the plane of one matrix being parallel to that of the other matrix, the spheres of one matrix located so as to lie at least mostly against the spheres of the other matrix so that rotation of spheres of one matrix results in counter rotation of spheres of the other matrix.
2. A mat according to claim 1 wherein the spheres are between 25 mm and 15 mm in diameter.
3. A mat according to claim 1 or 2 further comprising an inflatable platform arranged to be detachably joined to the mat.
4. A mat according to claim 3 wherein the inflatable platform is provided with detachable poles disposable on either side of the platform and so arranged for carrying the platform.
5. A mat according to claim 1 wherein the spheres are between 2.5 and 7.5 mm in diameter.
6. A mat according to claim 1 or 5 wherein the spheres are woven into each matrix.
7. A mat substantially as described with reference to any one or more of the accompanying drawings.

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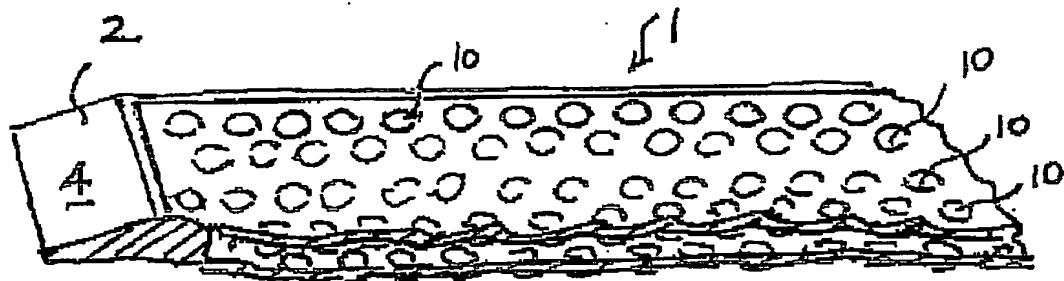


FIG 1

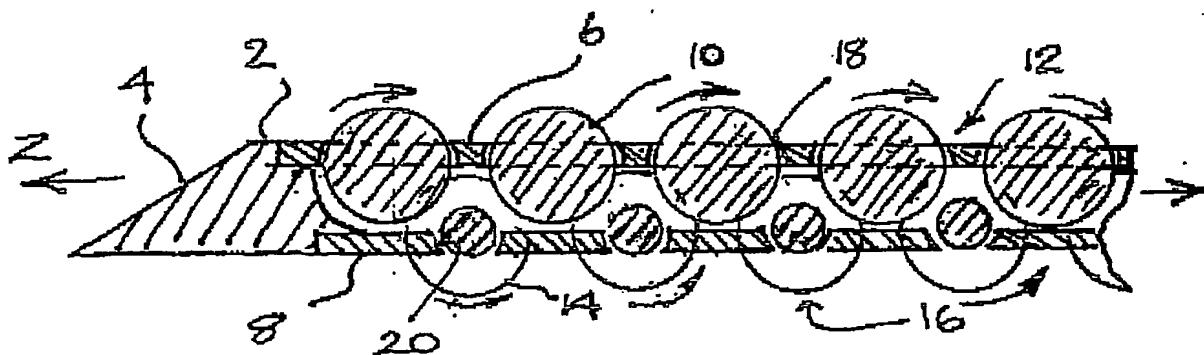


FIG 2

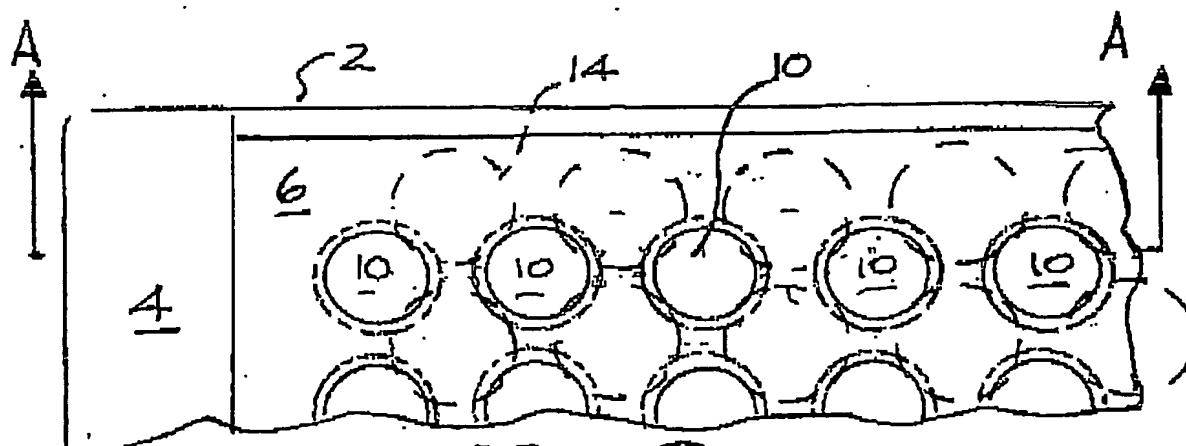
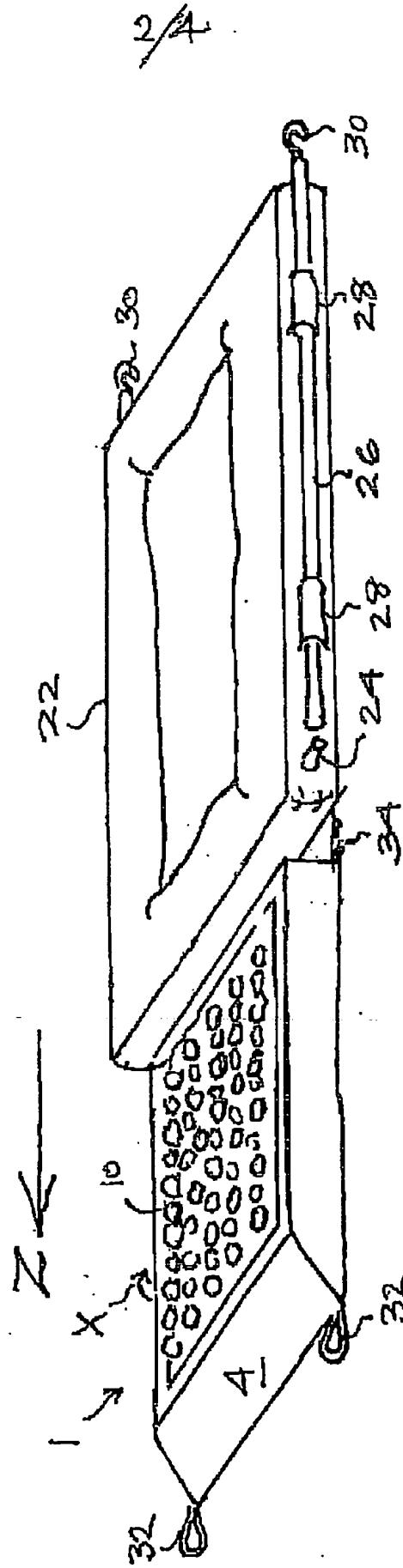
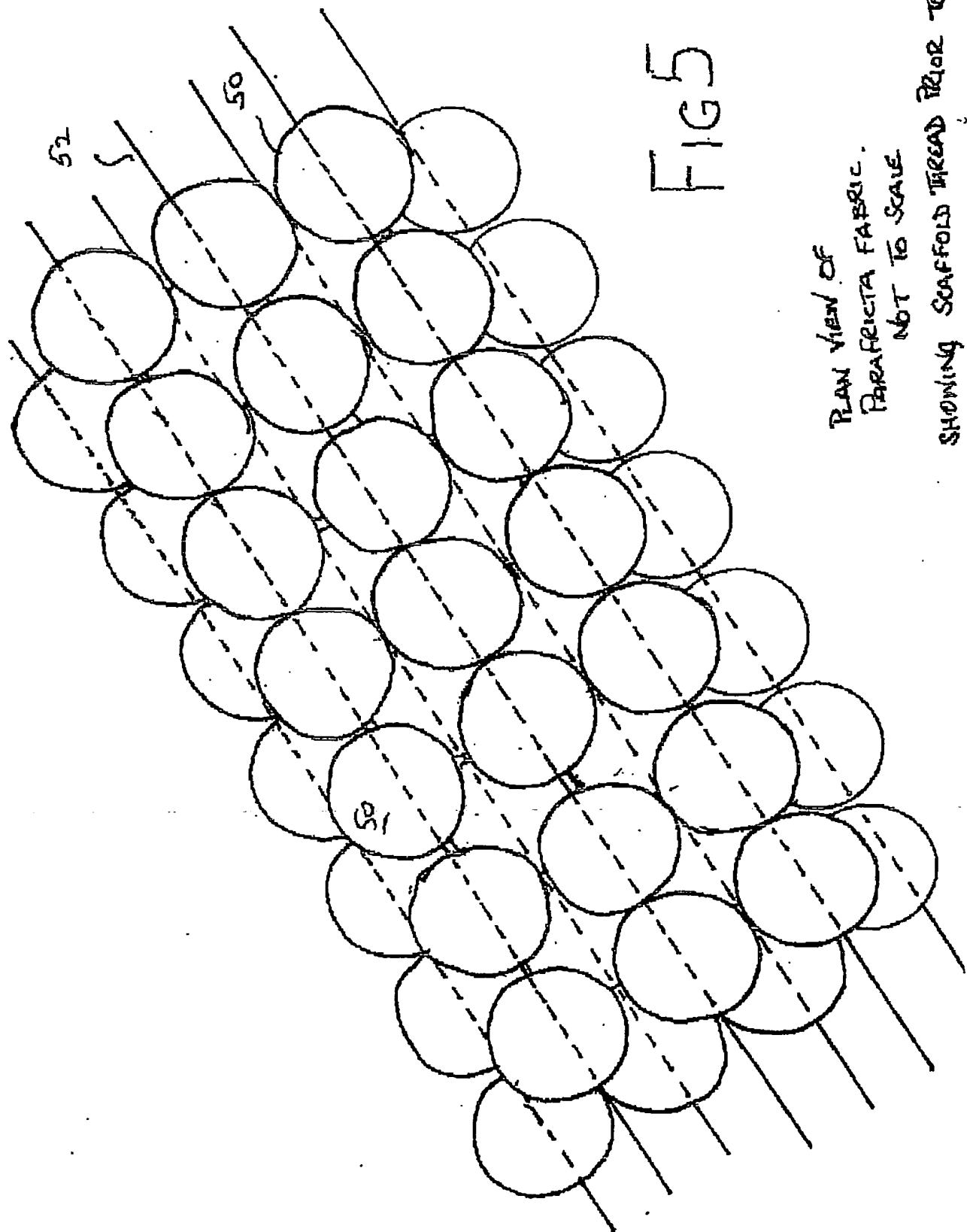
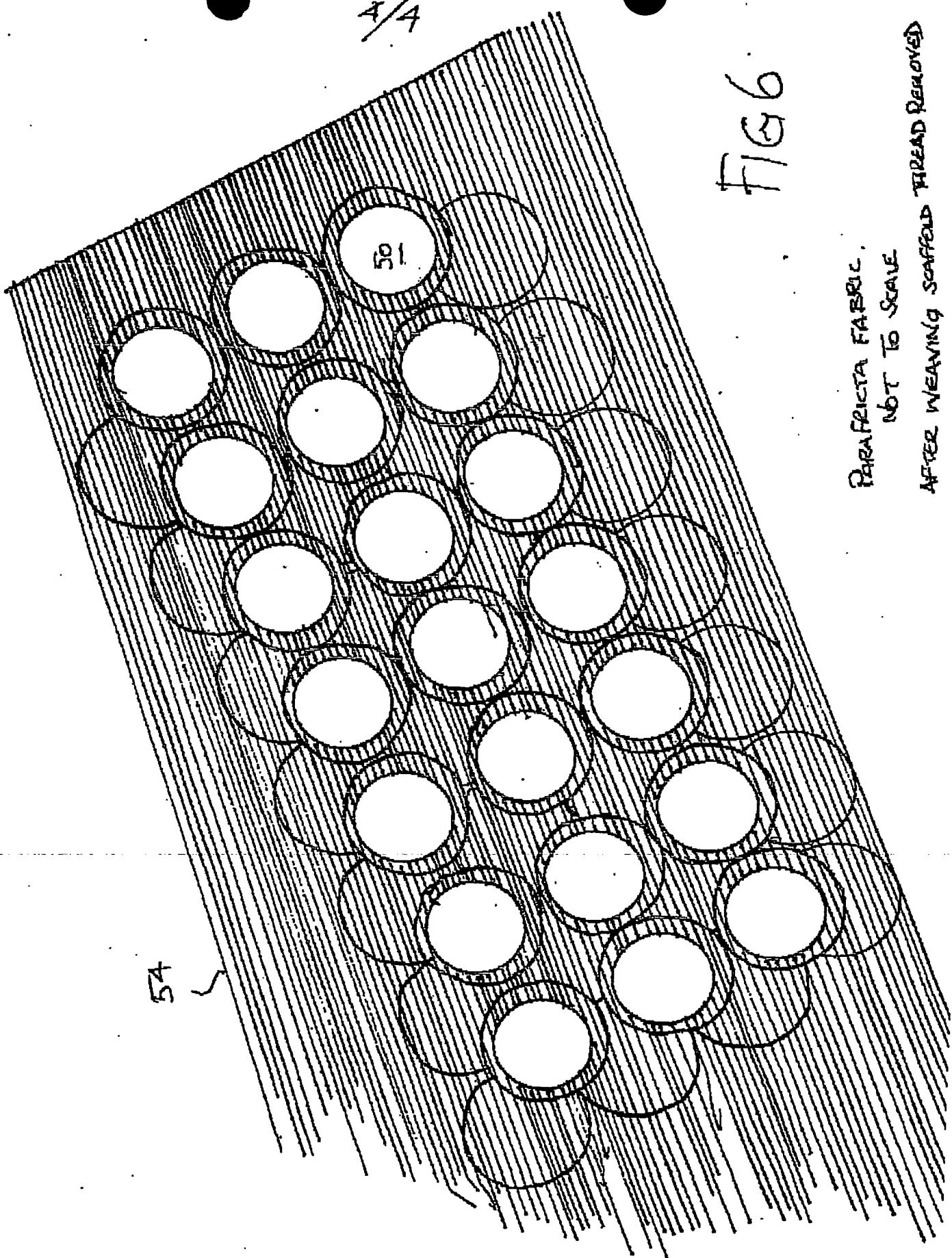


FIG 3



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PCT Application

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